

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended): A method for manufacturing a mask blank by depositing a film of a resist liquid on a substrate including a thin film ~~functioning as a transfer pattern~~ by a spin-coating process; covering the surface of the substrate with a covering member; and performing an unnecessary film removal process by dissolving of an unnecessary part of the resist film by supplying a solvent from above the covering member during the rotation of the substrate and the covering member together so that the solvent is supplied to the periphery of the substrate, wherein:

the spin-coating process includes a spin-drying process for preliminary-drying the film of the resist liquid by rotating the substrate, and

a reduced-pressure-drying process for the resist film deposited in the spin-coating process is performed before the unnecessary-film-removing process for removing the unnecessary part of the resist film by dissolving so that a deterioration in an in-plane-film thickness uniformity of the resist film caused by the unnecessary-film-removing process is suppressed,

~~wherein a difference between a maximum thickness of the resist film and a minimum thickness of the resist film at a region where a transfer pattern is formed is 50 angstroms or less after the unnecessary-film-removing process~~

wherein a degree of vacuum in the reduced-pressure-drying process is controlled to suppress a flow of a resist from a central part of the substrate toward the periphery of the substrate by a temperature distribution and a centrifugal force in the unnecessary-film-removing process.

2. (Original): The method for manufacturing the mask blank according to claim 1, wherein:

the spin-coating process is performed in a cup having an opening on an upside by dropping a resist liquid on the surface of the substrate, rotating the substrate at a predetermined rotating speed for a predetermined period of time in order to uniform the film thickness of the

resist liquid, and rotating the substrate at a predetermined rotating speed for a predetermined period of time in order to preliminarily dry the film of the resist liquid.

3. (Original): The method for manufacturing the mask blank according to claim 2, wherein:

the rotating speed of the substrate for the preliminary drying of the film of the resist liquid is lower than that for uniformizing the film thickness of the resist liquid in the spin-coating process.

4. (Previously Presented): The method for manufacturing the mask blank according to claim 2, wherein:

an airstream from the upside of the cup toward the substrate is generated by exhausting at the downside of the cup in the spin-coating process.

5. (Previously Presented): The method for manufacturing the mask blank according to claim 1, wherein:

the degree of vacuum in a substrate-receiving space is stepwise decreased in the reduced-pressure-drying process.

6. (Currently Amended): A method for manufacturing a mask blank, comprising:
depositing a resist liquid dropped on a substrate having a thin film by a spin-coating process;

forming a resist film by drying the deposited film of the resist liquid by a spin-drying process;

drying the resist film by a reduced-pressure-drying process;

supplying a solvent for dissolving the resist film to a periphery of the mask blank on which the resist film is formed; and

removing the resist film at the periphery by rotating the mask blank,

wherein a degree of vacuum in the reduced-pressure-drying process is controlled to suppress a flow of a resist from a central part of the substrate toward a periphery of the substrate by a temperature distribution and a centrifugal force in the removing of the resist film.

7. (Cancelled) .

8. (Previously Presented): The method for manufacturing the mask blank according to claim 1 or 6, wherein:

the resist film at a region where a transfer pattern is formed comprises the periphery having a thickness not exceeding that of the central part of the mask blank after the removing of the resist film at the periphery.

9. (Previously Presented): The method for manufacturing the mask blank according to claim 1 or 6, wherein:

the substrate is in a stationary state when the reduced-pressure-drying process is performed.

10. (Previously Presented): The method for manufacturing the mask blank according to claim 6, wherein:

the rotating speed of the substrate in the spin-drying process is lower than that in the spin-coating process for depositing the film of the resist liquid.

11. (Previously Presented): The method for manufacturing the mask blank according to claim 6, wherein:

the mask blank is heated for drying the resist film after the removing of the resist film at the periphery.

12. (Previously Presented): The method for manufacturing the mask blank according to claim 1, wherein:

the spin-drying process dries the film of the resist liquid so that the resist film formed at the periphery of the substrate does not have fluidity.

13. (Currently Amended): The method for manufacturing the mask blank according to claim 1, wherein:

the reduced-pressure-drying process dries the resist film to an extent not to flow by [[a]] the temperature distribution [[[or a]] and the centrifugal force in the unnecessary-film-removing process.

14. (Previously Presented): The method for manufacturing the mask blank according to claim 1, wherein:

the substrate is a quadrangular substrate.

15. (Previously Presented): The method for manufacturing the mask blank according to claim 6, wherein:

the spin-drying process dries the deposited film of the resist liquid so that the resist film formed at the periphery of the mask blank does not have fluidity.

16. (Currently Amended): The method for manufacturing the mask blank according to claim 6, wherein:

the reduced-pressure-drying process dries the resist film to an extent not to flow by ~~[[a]]~~ the temperature distribution ~~[[or a]]~~ and the centrifugal force in the removing of the resist film.

17. (Previously Presented): The method for manufacturing the mask blank according to claim 6, wherein:

the substrate is a quadrangular substrate.

18. (Cancelled).

19. (Currently Amended): A method for manufacturing ~~[[a]]~~ the mask blank according to claim 1 or 6 by depositing a film of a resist liquid on a substrate including a thin film functioning as a transfer pattern by a spin-coating process; covering the surface of the substrate with a covering member; and performing an unnecessary film removing process by dissolving of an unnecessary part of the resist film by supplying a solvent from above the covering member during the rotation of the substrate and the covering member together so that the solvent is supplied to the periphery of the substrate, wherein:

the spin-coating process includes a spin-drying process for preliminary drying the film of the resist liquid by rotating the substrate;

a reduced-pressure-drying process for the resist film deposited in the spin-coating process is performed before the unnecessary film removing process for removing the unnecessary part of the resist film by dissolving to suppress the flow of the resist film from the central part of the substrate toward the periphery of the substrate by the temperature distribution in the unnecessary film removing process so that a deterioration in an in-plane film thickness uniformity of the resist film caused by the unnecessary film removing process is suppressed;

wherein a difference between a maximum thickness of the resist film and a minimum thickness of the resist film at a region where a transfer pattern is formed is 50 angstroms or less after the removing of the resist film at the periphery.

20. – 24. (Cancelled),

25. (New): A method for manufacturing a mask having a transfer pattern by preparing a substrate including a thin film; depositing a film of a resist liquid on the substrate including the thin film by a spin-coating process; covering the surface of the substrate with a covering member; and performing an unnecessary film removal process by dissolving of an unnecessary part of the resist film by supplying a solvent from above the covering member during the rotation of the substrate and the covering member together so that the solvent is supplied to the periphery of the substrate, to thereby obtain the mask having the transfer pattern wherein:

the spin-coating process includes a spin-drying process for preliminary-drying the film of the resist liquid by rotating the substrate, and

a reduced-pressure-drying process for the resist film deposited in the spin-coating process is performed before the unnecessary-film-removing process for removing the unnecessary part of the resist film by dissolving so that a deterioration in an in-plane-film thickness uniformity of the resist film caused by the unnecessary-film-removing process is suppressed,

wherein a degree of vacuum in the reduced-pressure-drying process is controlled to suppress a flow of a resist film from a central part of the substrate toward the periphery of the substrate by a temperature distribution and a centrifugal force in the unnecessary-film-removing process.

26. (New): A method for manufacturing a mask having a transfer pattern, comprising:
preparing a substrate including a thin film;
depositing a resist liquid dropped on the substrate having the thin film by a spin-coating process;
forming a resist film by drying the deposited film of the resist liquid by a spin-drying process;
drying the resist film by a reduced-pressure-drying process;

supplying a solvent for dissolving the resist film to a periphery of the substrate on which the resist film is formed; and

removing the resist film at the periphery by rotating the substrate,

wherein a degree of vacuum in the reduced-pressure-drying process is controlled to suppress a flow of a resist from a central part of the substrate toward the periphery of the substrate by a temperature distribution and a centrifugal force in the removing of the resist film, to thereby obtain the mask having the transfer pattern.